

DO0AN-B

MULTIPLIER, FREQUENCY

1. GENERAL DESCRIPTION. This procurement requires a solid-state, frequency doubler/tripler capable of producing 18 to 26 GHz (2X) and 26 to 40 GHz (3X) signals from any 8.6 to 13.4 GHz signal source. The instrument shall provide a controllable output to at least +5 dBm in the (2X) mode and to at least -3 dBm in the (3X) mode reproducing sweep or modulation as defined by the input source.

2. CLASSIFICATION. The equipment shall meet the requirements of MIL-T-28800D, Type II, Class 5, Style E, Color R for Navy shipboard, submarine, and shore applications with the following modifications and exceptions:

- a. The nonoperating temperature requirement is limited to the range of -40°C to +70°C.
- b. The relative humidity requirement is limited to 95% noncondensating.
- c. The operating and nonoperating altitude requirements are not invoked.
- d. The warm-up time is extended to one hour.

3. OPERATIONAL REQUIREMENTS. The equipment shall be capable of doubling or tripling input frequencies within the parameters and accuracies specified herein.

3.1 Frequency characteristics.

3.1.1 Input. 8.6 to 13.4 GHz; -2 to +5 dBm.

3.1.2 Output range. 18 to 26 GHz for (2X) mode; 26 to 40 GHz for (3X) mode.

3.1.3 Output resolution. Two times the resolution of the input frequency for the (2X) mode and three times the resolution of the input frequency for the (3X) mode.

3.1.4 Output accuracy and stability. Two times the accuracy and stability of the input frequency for the (2X) mode and three times the accuracy and stability of the input frequency for the (3X) mode.

3.2 Output characteristics.

3.2.1 Level. At least +5 dBm for (2X) mode; at least -3 dBm for (3X) mode.

3.2.2 Leveled range. At least -15 to +5 dBm adjustable in at least 1.0 dB steps with at least -2 dBm input level in the 2X mode; at least -15 to -3 dBm adjustable in at least 1.0 dB steps with at least -2 dBm input level in the 3X mode.

3.2.3 Accuracy and flatness. At least {3.0 dB for (2X) mode and at least ± 3.0 dB for (3X) mode between 0 and 50°C.

3.2.4 Impedance. 50 ohms nominal.

3.2.5 Output connector. WR-42 WG waveguide with UG-595/U type flange for the (2X) mode and WR-28 WG waveguide with UG-599/U type flange for the (3X) mode.

3.2.5.1 VSWR. Less than or equal to 2:1.

3.2.6 Input connector. Type WPM-3(f).

3.3 Spectral purity.

3.3.1 Harmonics/Subharmonics. Less than -20 dBc.

3.3.2 Spurious. Less than -40 dBc.

3.4 Modulation compliance.

3.4.1 Frequency modulation. Follows input with 2 times the deviation for the (2X) mode and 3 times the deviation for the (3X) mode.

3.4.2 Pulse/Square wave modulation. Follows input with PRF of 100 Hz to 1 MHz; minimum pulse width of 0.1 us.

4. GENERAL REQUIREMENTS.

4.1 Power source. 115/230 Vac $\pm 10\%$, 60 or 400 Hz $\pm 10\%$, 25W maximum.

4.2 Weight. The overall weight of the unit shall not exceed 4.0 kg (8.8 lbs).

4.3 Dimensions. The total volume of the unit shall not exceed 8,702 cubic cm (531 cubic in).

4.4 Remote operation. Instrument shall be capable of operating via the IEEE-488 interface bus and providing the capability to talk and listen.

4.5 Lithium batteries. Per MIL-T-28800, lithium batteries are prohibited without prior authorization. A request for approval for the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.